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Canright

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[54] **MEAT SMOKING AND MERCHANDISE DISPLAY CASE**

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Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 506,991, Sept. 18, 1974, Pat. No. 3,942,425.

[51] **Int. Cl.**[2] **A01J 11/00;** A23B 4/04

[52] **U.S. Cl.** **99/468;** 99/482

[58] **Field of Search** 99/467-468, 99/474, 479, 482, 473; 21/109-110; 43/127-128; 34/51

[56] **References Cited**

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[57] **ABSTRACT**

A meat smoking and merchandise display case comprising an outer casing, a vertically extending and rotatably driven cylinder mounted in said outer casing and to which food products are adapted to be secured, smoke producing means in said case adapted to be activated by heating means, temperature control means adapted to deactivate said heating means at a predetermined temperature, smoke control means adapted to measure the density of smoke within said case and deactivate said heating means when the smoke exceeds a desired density, and means to selectively evacuate the smoke from said case.

9 Claims, 5 Drawing Figures

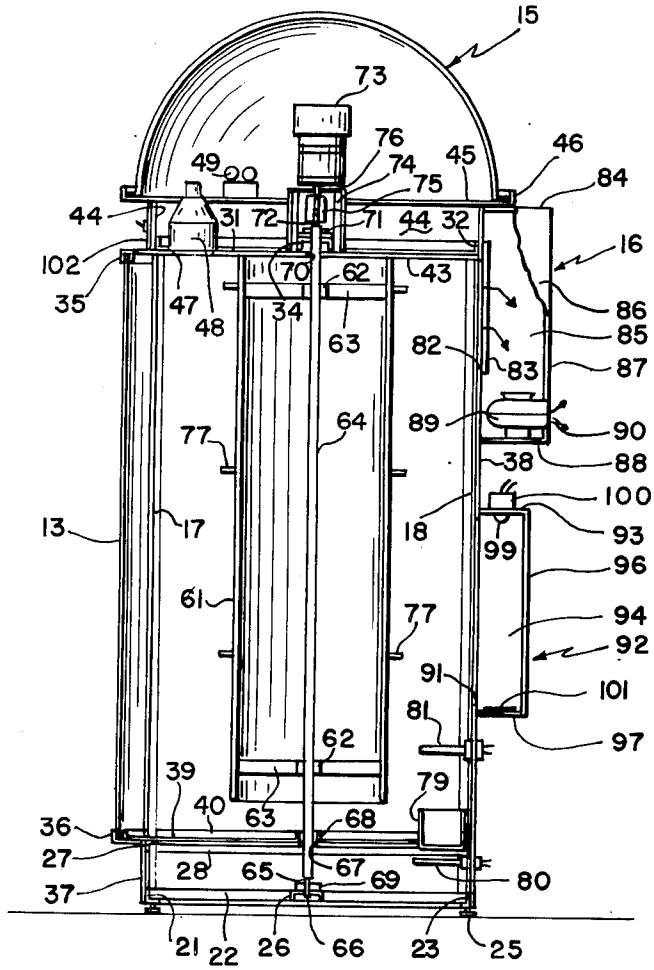


FIG. 1

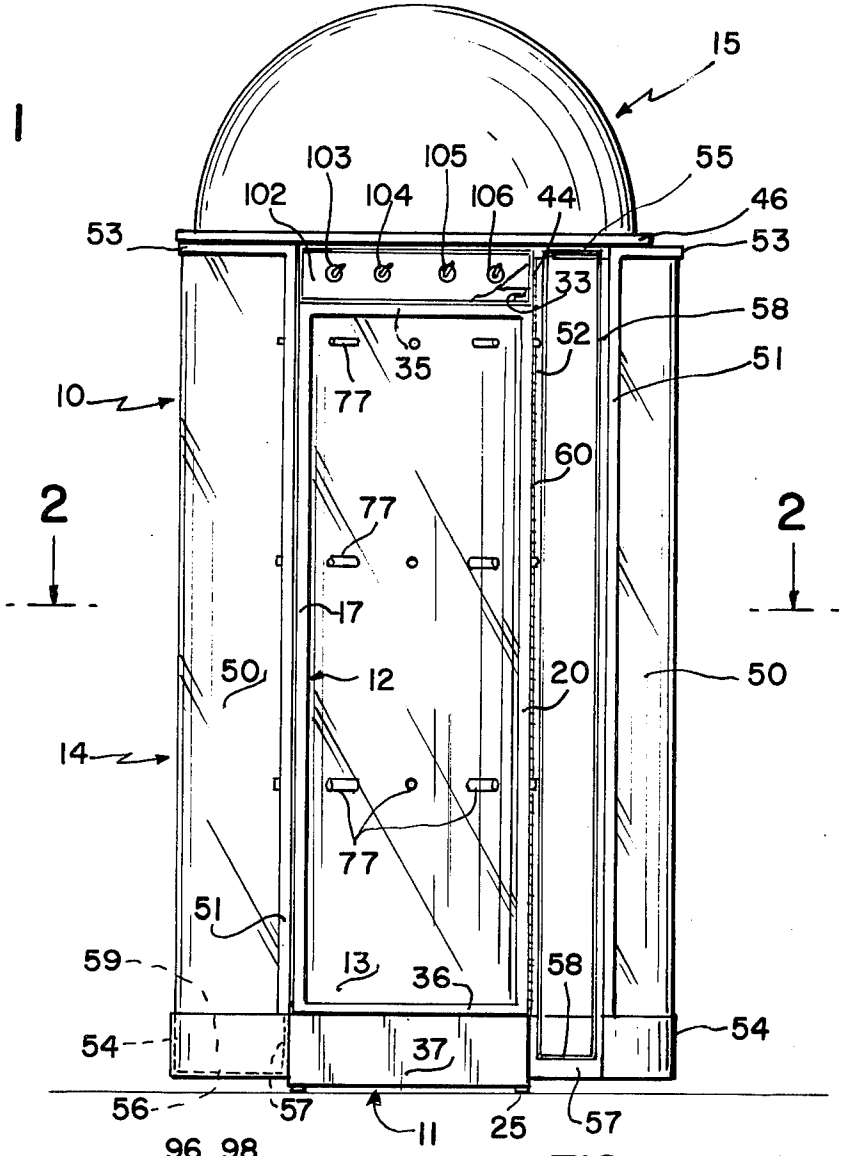


FIG. 2

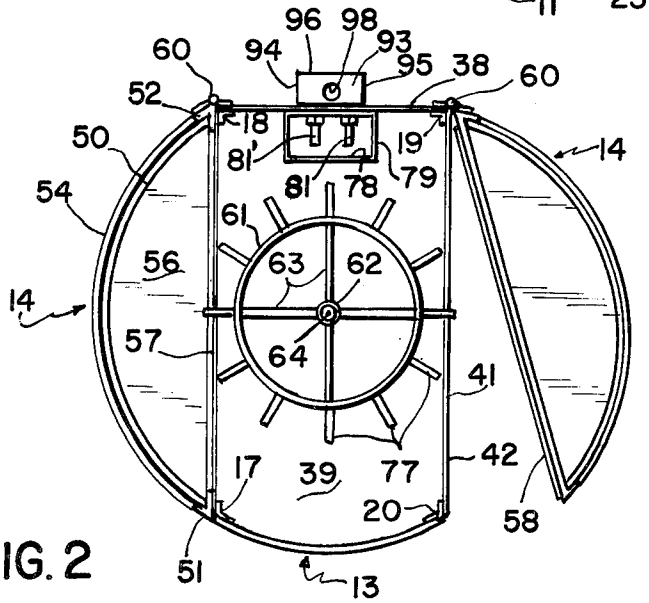


FIG. 3

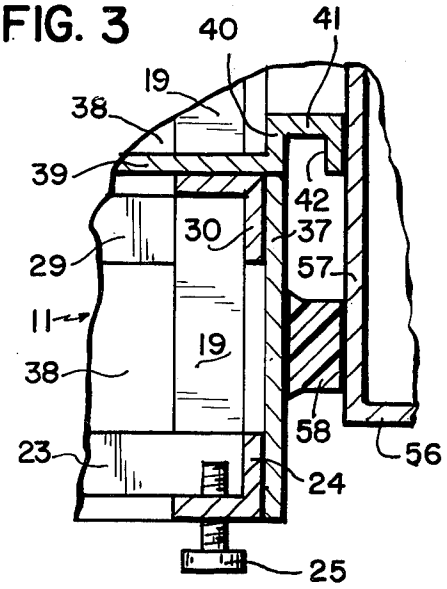
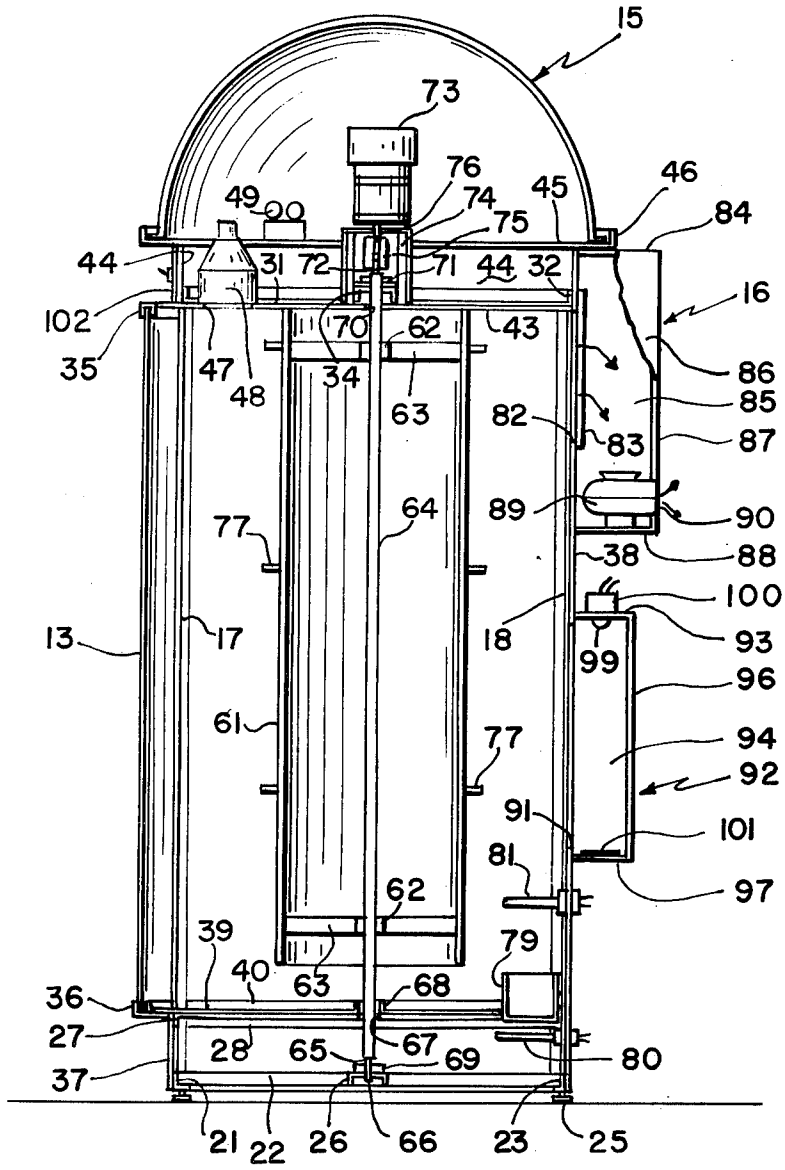


FIG. 4


15
73
76
74
75
45
46
84
49
00
44
31
72
71
44
32
16
102
70
62
43
35
47
48
34
63
86
85
82
83
87
64
89
90
77
38
88
100
13
17
18
93
99
96
61
77
94
92
91
101
81
97
62
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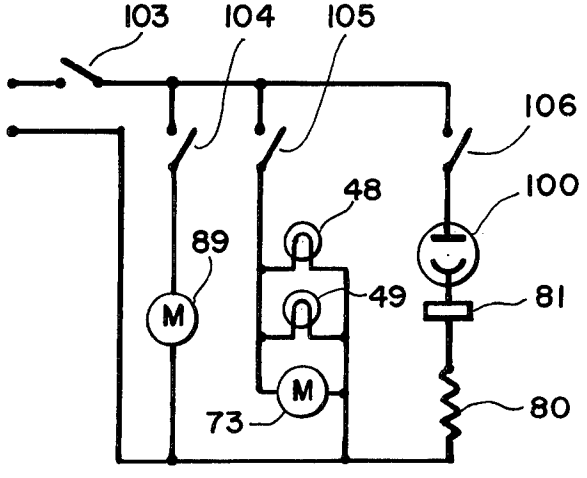

103
104
105
106
48
100
89
49
81
M
M
73
80

FIG. 5

MEAT SMOKING AND MERCHANDISE DISPLAY CASE

REFERENCE TO RELATED APPLICATION

This application is a continuation-in-part of applicant's copending application Ser. No. 506,991, filed on Sept. 18, 1974, now U.S. Pat. No. 3,942,425.

BACKGROUND OF THE INVENTION

Heretofore it has been the general practice to construct smoke houses, smoking towers and boxes in any desired shape with a solid, insulated outer casing; the products undergoing smoking are normally suspended from the ceiling of said casing. In general, no effort has been made in such prior art devices to control the temperature or density of smoke and deactivate the smoke producing means if the temperature or density of smoke exceeds desired limits.

SUMMARY OF THE INVENTION

It is therefore the primary object of the invention to provide a meat smoking and merchandise display case wherein the food products undergoing processing are visible at all times and after processing the said food products are advantageously displayed to propspective user of said products or customer.

Another object is to provide such a device wherein the smoking process is conducted under desired conditions of temperature and smoke density and said device may be used by all establishements that sell or serve smoked food products to customers.

Still another object is to provide such a device which may easily be cleaned and maintained in sanitary condition.

A final object is to provide such a smoking device which is simple in design, inexpensive to manufacture, easy to use, and efficient in operation.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a front elevational view of the preferred embodiment of the invention, showing one of the doors in partly open condition.

FIG. **2** is a horizontal sectional view, taken on the line 2—2 of FIG. **1**, looking in the direction of the arrows.

FIG. is a fragmentary, greatly enlarged vertical sectional view, taken along the transverse axis through the most lateral portion of the base of the embodiment of FIG. **1**.

FIG. **4** is a vertical section view taken along the approximate medial, longitudinal axis of the case.

FIG. **5** is a schematic diagram of the electrical components used in the subject invention.

DESCRIPTION OF PREFERRED EMBODIMENTS

Referring now to the drawings, wherein like reference characters designate like or corresponding parts throughout the several views, there is shown in FIGS. **1—4** of the drawings a preferred embodiment of meat smoking and merchandise display case **10** of the subject invention which comprises, in general, base **11**, frame **12**, front panel **13** of transparent material, a plurality of transparent doors **14** hingedly mounted on selected portions of said case, shaped canopy **15**, and a housing **16** (see FIG. **4**) mounted on the rear of said case.

Frame **12** comprises vertically extending members **17–20** of desired height and preferably of angular stock,

said members open inwardly and are secured downwardly to base **11**; as best seen in FIGS. **3** and **4**, base **11** terminates downwardly in a generally rectangular frame comprising horizontally extending members **21–24**, preferably of angular stock which open upwardly and inwardly. The legs of vertical frame members **17–20** are aligned with and butt welded to each corner of the frame comprising members **21–24**. If desired, leveling screws **25** or casters may conventionally be applied to selected portions of said base **11**. A transversely extending and downwardly opening channel **26** is fixedly secured to the approximate center of opposing members **22, 24**. Horizontally extending members **27–30**, secured intermediate the respective adjacent vertically extending members, parallel members **21–24**, respectively, and spaced a desired distance vertically thereabove; members **27–30** are preferably of angular stock, opening downwardly and inwardly with the downwardly depending leg of each of said members **27–30** aligned with and butt welded to the adjacent vertical frame members.

Frame members **17–20** terminate upwardly in the same horizontal plane; frame members **31–33** of angular stock are formed into a horizontally extending, U-shaped frame which opens forwardly and each of said members open upwardly and inwardly. A transversely extending and downwardly opening channel **34** is fixedly secured to the approximate center of opposing members **31, 33**. Vertical frame members **17, 20** are aligned with and butt welded to the foremost edges of members **31, 33** respectively while frame members **18, 19** are aligned with and butt welded to the rearmost corners of the frame comprising the said members **31–33**.

Front panel **13** of heat-resistant glass or plastic composition is arcuate in horizontal section and secured laterally to the foremost, transversely aligned legs of vertical frame members **17, 20**; panel **13** is secured upwardly to frame member **35** which lies in a plane parallel to and slightly below the horizontal plane of members **31–33**; downwardly said front panel is secured to arcuate frame member **36** which lies in a plane parallel to and slightly above the horizontal plane of members **27–30**. A vertically extending skirt **37** of metallic composition is secured to at least the front and opposing sides of base **11** intermediate members **21, 22** and **24** and members **27, 28** and **30**, respectively.

Vertically extending rear panel **38** of metallic composition is secured upwardly to member **32**, laterally to the rear surface of the transversely aligned legs of frame members **18, 19** and downwardly to the transversely extending leg of frame member **23**. Horizontally extending base plate **39**, of metallic composition, at least partially overlies the horizontally extending legs of members **27–30** and is selectively secured thereto. Rearwardly, base plate **39** overlies member **29** and is secured to rear panel **38** in a liquid-tight joint. As viewed in FIG. **3** of the drawings, intermediate the vertical frame members **17–18** and **19–20**, vertically extending flange **40** of said base plate lies in the approximate vertical plane of skirt **37**; the drip guard thus formed further includes horizontally and outwardly extending flange **41** and downwardly depending flange **42**. That portion of base plate **39** which extends forwardly of vertical frame members **17, 20** is generally arcuate in plan and the foremost edge thereof is secured to frame member **36** of front panel **13** in a liquid-tight joint.

Horizontally extending top plate **43** of metallic composition terminates laterally in the approximate plane of the outermost surface of the vertically extending legs of members **31**, **33** and is secured thereto. Top plate **43** is secured rearwardly to member **32** and rear panel **38**; forwardly of vertical frame members **17**, **20** said plate is generally arcuate in plan with the foremost edge therof secured to frame member **35** in a liquid-tight joint. An essentially rectangularly-shaped and vertically extending skirt **44** of metallic composition and desired height is adapted to pass outwardly of the vertically extending legs of frame members **31–33** and secured thereto. Disc **45**, terminating circumferentially in upturned flange **46**, is fixedly secured to the upper edges of skirt **44**. Canopy **15** of desired shape and preferably of translucent material, is supported on disc **45**. A plurality of openings **47** in top plate **43**, in any desired pattern or arrangement, accommodate downwardly directed display lights **48**. Additionally, one or more electic lights **49** are conventionally mounted on disc **45** or other supporting structure and directed upwardly to illuminate canopy **15**.

Each door **14** consists of a panel **50** of transparent, heat-resistant composition, arcuate in horizontal section and conforming to the curvature of panel **13**. Panel **50** is supported laterally by vertically extending frame members **51–52**, upwardly to horizontally extending frame member **53** which is adapted to pass beneath the lower surface of disc **45**, and downwardly to frame member **54**. As best seen in FIG. **1**, frame member **53** is of uniform thickness and essentially semi-circular in plan, terminating inwardly in vertically extending flat **55** which in closed condition of said door is slightly spaced from and parallel to skirt **44** on the upper side of the case. Panel **50** is conventionally secured to the arcuate outer edge of frame member **53** preferably in a liquid-tight joint.

Frame member **54** of metallic composition and conforming to the curvature of panel **50** terminates downwardly in an integrally formed, horizontally extending and semi-circularly shaped base **56** which is at least slightly above the floor level; vertically extending inner wall **57** is secured downwardly to said base and laterally to the vertical edges of frame member **54** and in closed condition wall **57** bears against flange **42** and is slightly spaced from and parallels skirt **37** on the side of base **11**. Gasket **58**, preferably of a composition having magnetic properties, is secured to selected portions on the innermost surfaces of frame members **51–52**, flat **55** and wall **57** to maintain said door in sealed, smoke-tight condition. It is understood that an upwardly opening, hollow container **59** is formed on the lower, inner portion of each door bounded by frame members **54**, base **56** and wall **57** to accommodate chips of hickory or other woods utilized during the processing of the meat and other food products. Piano hinge **60** is secured to frame member **52** of the door and either the most lateral portion of rear panel **38** or the transversely extending, rearmost surface of frame member **18**. It is further understood that the opposing door is hingedly mounted on the opposite side of the case in like manner.

Referring now to FIGS. **2** and **4** of the drawings, a vertically extending cylinder **61** of metallic or other heat-resistant composition is rotatably mounted within the case thus formed; specifically, an axially extending collar **62** is carried at least in proximity to each end of said cylinder by means of radially extending supports **63** radiating therefrom which are secured outwardly to the inner surface of said cylinder. An elongated shaft **64**, greater in length than the height of said cylinder, is fixedly secured in each collar **62**. Downwardly, shaft **64** includes shoulder **65** and section **66** of reduced diameter. Bore **67** in the approximate center of base plate **39**, preferably including collar **68** concentric therewith, accommodates shaft **64**; section **66** is journaled in the race of thrust bearing **69** carried on channel **26** and thence through a vertically aligned bore (not shown) in said channel. The upper end of shaft **64** is passed through bore **70** in the approximate center of top plate **43**, through an aligned bore (not shown) in channel **34**, and journaled in bearing **71** carried on said channel. Shaft **64** terminates upwardly in section **72** of reduced diameter. Gear motor **73** is secured to channel **34** by means of mounting bracket **74**. Coupler **75** such as is well known in the art connects to section **72** of said shaft and shaft **76** of said gear motor.

A plurality of radially extending rods **77** of desired length, in any pattern or arrangement, are fixedly secured to the outer surface of cylinder **61** to support meat or other food products thereon. Furthermore, an annular gutter may be secured in proximity to the lower end of cylinder **61** to catch the drippings from the meat during processing.

An essentially rectangular opening **78** is provided in the rearmost, medial portion of base plate **39** and burn box **79** of heat-resistant, metallic composition fixedly secured therein. Heating element **80** is secured to rear panel **38** downwardly of burn box **79** and upon energization causes the wood chips carried therein to smoulder and emit smoke which is used to process the foods. Thermoswitch **81**, secured to panel **38** at least slightly above the burn box, cuts off heating element **80** when a desired, predetermined temperature of approximately 50° Centigrade is detected. An additional thermoswitch **81'** is desirably placed adjacent thermoswitch **81** to cut off all electrical power if a fire should occur within the case.

Opening **82** of desired shape is provided in the upper portion of rear panel **38** with a filter **83** detachably secured thereover. Housing **16**, heretofore mentioned, includes top **84**, opposing sides **85–86**, back **87** and bottom **88**, said housing is secured in a selected portion on the upper rear of said casing with top **84** slightly below the plane of disc **45**. Blower **89** is conventionally mounted in housing **16** in proximity to bottom **88** and when activated draws smoke out of the case, through filter **83**, and thence through opening **90** in back **87**. If desired, a flue or other conduit may be secured about opening **90** to exhaust the smoke to a remote location.

An elongated, essentially rectangular opening **91** is provided in the approximate center of rear panel **38**. Smoke chamber **92** comprising top **93**, opposing sides **94–95**, back **96** and bottom **97** is conventionally secured to said rear panel and communicates with the interior of the case through opening **91**. Bore **98** in top **93** accommodates lens **99** of a conventional photocell **100** while the coacting mirror **101** is secured on the upper surface of bottom **97**. The smoke chamber and accompanying apparatus is used to determine the density of smoke within the case so that the food products undergoing processing are not obscured and said food products may be visually inspected at all times. Specifically, if the smoke within chamber **92** exceeds such a predetermined, desired density the heating element **80** is deactivated until such time that the smoke within said case is exhausted by means of blower **89** or otherwise falls within an acceptable range.

Control panel **102** is mounted vertically above panel **13** and forwardly of skirt **44**; said control panel has mounted thereon electrical switches **103–106**. As illustrated in FIG. **5**, a **110** volt, alternating current is applied to case **10** through master switch **103**. Switch **104** is connected to blower **89**; switch **105** activates lights **48**, **49** and gear motor **73**; and switch **106** is in a circuit including heating element **80**, thermoswitch **81** and photocell **100**. As heretofore mentioned, if the temperature from the burn box exceeds a selected, predetermined temperature, as indicated by thermoswitch **81**, or the density of the smoke within the case exceeds a predetermined density, as indicated by photocell **100** and coacting mirror **101** in chamber **92**, heating element **80** is deactivated until such time that such abnormal conditions are corrected. The several electrically operated components within case **10** may obviously be electrically connected in any conventional manner whereby said components may be activated separately or any desired combination of such components activated by a selected switch.

In use, meat or other food products are secured on rods **77** and the doors **14** closed. Upon closing master switch **103** the several electrical components may be selectively energized. For example, switch **105** permits energization of display lights **48**, light **49** which illuminates canopy **15**, and gear motor **73** which drives cylinder **61**. Heating element **80** is energized by means of switch **106** and thereafter controlled by thermoswitch **81** and smoke chamber **92** in the manner heretofore described in detail. After completion of the smoking process, heating element **80** is deactivated and, if required, blower **89** activated by means of switch **104** to remove smoke from within the case. The food products may be retained in the case for storage and display purposes, or removed.

In a modification of such invention, rear panel **38** is secured laterally to the foremost surfaces of the transversely aligned legs of vertical frame members **18–19**, upwardly to member **32** and downwardly to frame member **29**. Additionally, an auxiliary housing (not shown) may be detachably secured to rear panel **38** downwardly of housing **16** to cover the several components on the lower, rear portion of the case.

It should be understood, of course, that the foregoing disclosure relates to only preferred embodiments of the invention and that it is intended to cover all changes and modifications of the invention herein chosen for the purposes of the disclosure which do not constitute departures from the spirit and scope of the invention.

What is claimed is:

1. A meat smoking and merchandise display case adapted to treat food products by smoke producing means comprising

a base,

an outer casing mounted on said base,

at least a portion of said outer casing of transparent material,

said case terminating upwardly in a shaped canopy,

an elongated, vertically extending inner casing rotatably mounted in said outer casing,

means to rotate said inner casing,

food product support means on said inner casing,

said smoke producing means in proximity to said base intermediate said outer and inner casings,

heating means adapted to activate said smoke producing means,

temperature control means adapted to regulate said heating means,

smoke control means adapted to detect the smoke density and to regulate said heating means when the smoke from said smoke producing means exceeds a predetermined density, and

means responsive to said smoke control means to selectively exhaust the smoke from said case.

2. The invention of claim **1** further including means to at least partially illuminate said inner casing.

3. The invention of claim **2** further including means to at least partially illuminate said canopy.

4. The invention of claim **1** wherein said means to rotate said inner casing is mounted under said canopy.

5. The invention of claim **1** further including filter means coacting with said means to selectively exhaust the smoke from said case.

6. The invention of claim **1** further including a plurality of doors of transparent material in said outer casing.

7. The invention of claim **1** wherein said outer casing includes a fixed panel of transparent material and at least one door laterally of each side of said fixed panel.

8. The invention of claim **1** further including an elongated, vertically extending shaft driven by said means to rotate said inner casing, and connecting means intermediate said shaft and said inner casing.

9. A meat smoking and merchandise display case adapted to treat food products by smoke producing means comprising

a base,

an outer casing at least partially secured to said base,

said case terminating upwardly in a shaped canopy,

a vertically extending cylinder rotatably mounted in said outer casing,

means to rotate said cylinder,

food product support means on said cylinder,

said smoke producing means in a selected portion of said base intermediate said outer casing and said cylinder,

heating means adapted to activate said smoke producing means,

temperature control means adapted to regulate said heating means,

smoke control means adapted to detect the smoke density and to regulate said heating means when the smoke from said smoke producing means exceeds a predetermined density,

means responsive to said smoke control means to selectively exhaust the smoke from said case, and

filter means adapted to coact with said means to selectively exhaust the smoke from said case.

* * * * *